U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE B(U)
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0124/B(U), REVISION 13**

REVALIDATION OF CANADIAN COMPETENT AUTHORITY CERTIFICATE CDN/2042/B(U)

This certifies that the radioactive materials package design described below is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency[1] and the United States of America[2].

1. Package Identification - MDS Nordion Inc. F-245 Shipping Container, Serial Nos. 1 to 5 and 7 to 26.

2. Packaging Description and Authorized Radioactive Contents - as described in Canadian Certificate of Competent Authority CDN/2042/B(U), Revision 16 (attached).

3. General Conditions -

   a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation in accordance with the endorsed certificate.

   b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (DHM-23), Research and Special Programs Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.

   c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

4. Marking and Labeling - The package shall bear the marking USA/0124/B(U) in addition to other required markings and labeling.

5. Expiration Date - This certificate expires on January 31, 2002.

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1 "Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1973 Revised Edition, as amended," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

2 Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

CERTIFICATE USA/0124/B(U), REVISION 13

This certificate is issued in accordance with paragraph 806 of the IAEA Regulations and Section 173.473 of Title 49 of the Code of Federal Regulations, in response to the petition and information dated August 9, 2001 submitted by MDS Nordion Inc., Kanata, Ontario, Canada, and in consideration of other information on file in this Office.

Certified by:

Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

OCT 18 2001
(DATE)

Revision 13 - Issued to incorporate Canadian Nuclear Safety Commission Amendment No. 2, dated August 9, 2001, to Certificate CDN/2042/B(U), Rev. 16, and to extend the expiration date.

Certificati(n

Atomic Energy Control Board | Commission de contrôle de l'énergie atomique

RADIOACTIVE MATERIAL TYPE B(U) PACKAGE DESIGN APPROVAL CERTIFICATE NO. CDN/2042/B(U), (REV. 16)

30-A2-206-0

June 25, 1999

The Atomic Energy Control Board hereby certifies that the package, as described below, has been demonstrated to meet the regulatory requirements prescribed for Type B(U) packages as described in the Canadian *Transport Packaging of Radioactive Materials Regulations* and in the IAEA Regulations*, subject to the following limitations, terms and conditions.

All users of this authorization shall register their identity in writing with the Atomic Energy Control Board prior to the first use of this authorization and shall certify that they possess the necessary instructions for preparation of the package for shipment.

This certificate does not relieve the shipper from any requirement of the government of any country through or into which the package will be transported.

PACKAGE IDENTIFICATION

MDS Nordion International Inc. F-245 Shipping Container, serial nos. 1 to 5 and 7 to 26.

PACKAGING DESCRIPTION

The F-245 shipping container with F-248 bottle flask or F-336 tungsten alloy insert is packaged in a 483 mm diameter by 521 mm high fire resistant wood-lined drum overpack, as shown on MDS Nordion Drawing No. F132701-001, (Issue B). The F-245 uranium radiation shield and plug as shown on Nordion Drawing No. F124501-001 (Issue M) are 51 mm thick and are encased in 4.76 mm thick stainless steel. The F-248 inner containment system consists of a receptacle inside a brass or stainless steel container with a threaded stainless steel cap and "O" ring seal. The containment system for the F-336 tungsten alloy insert is the C-133 or special form capsule assembly. The total weight of the package is 126 kg.

An illustration of the package is shown on attached Drawing No. F-327/F-245, (Issue N).

The package shall bear the competent authority identification mark "CDN/2042/B(U)".

Canada

AUTHORIZED RADIOACTIVE CONTENTS

The package is authorized to contain not more than:

(1) 37 TBq (1,000 Ci) of molybdenum-99 and decay products in the form of:

(i) up to 115 g of molybdenum trioxide powder within a brass or stainless steel F-248 container, or

(ii) up to 110 ml of liquid sodium molybdate in 0.2 N sodium hydroxide within a brass or stainless steel F-248 container, or

(iii) up to 110 ml of liquid ammonium molybdate in 0.2 N ammonium hydroxide within a stainless steel F-248 container;

or

(2) 37 TBq (1,000 Ci) of iodine-131 in the form of liquid, up to 110 ml in 0.02 N sodium hydroxide within a brass or stainless steel F-248 container;

or

(3) 296 TBq (8,000 Ci) of iridium-192 pellets within an inner brass TC-347 holder and outer stainless steel C-133 single seal welded capsule, further contained within a F-336 tungsten alloy insert;

or

(4) 296 TBq (8,000 Ci) of iridium-192 with no more than 74 TBq (2,000 Ci) of iridium-192 in metallic form within any single Amersham Special Form capsule Model 849 or Nordion TC-346 Special Form capsule further contained within a F-336 tungsten alloy insert;

or

(5) 74 TBq (2,000 Ci) of iridium-192 in metallic form within any combination of the Australian Atomic Energy Commission Type 06, Type 08 or Type 10 Special Form capsules and further contained within a Nordion F-336 tungsten alloy insert;

or

(6) 296 TBq (8,000 Ci) of iridium-192 within any combination of MDS Nordion Europe Type G1, G2, G5, G6, G6A, G6B, G10, G11 or G21 Special Form capsules with no more than 7.4 TBq (200 Ci) of iridium-192 in metallic form within any single capsule, and further contained within a Nordion F-336 tungsten alloy insert;

or

(7) 296 TBq (8,000 Ci) of iridium-192 within any combination of MDS Nordion Europe Type G3 or G4 Special Form capsules with no more than 18.5 TBq (500 Ci) of iridium-192 in metallic form within any single capsule, and further contained within a Nordion F-336 tungsten alloy insert.

SHIPMENT

This package shall be prepared for shipment in accordance with Nordion Procedure No. IS/PP 0016 F000 (5), "Preparation for Shipment Procedure for the F-327 Family of Transport Packagings" and the Canadian *Transport Packaging of Radioactive Materials Regulations*, and the IAEA Regulations*.

EXPIRY DATE

This certificate expires June 30, 2001.

R. Thomas
Director
Materials Regulation Division

REFERENCE

* International Atomic Energy Agency Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1973 Revised Edition (as amended).

NOTES

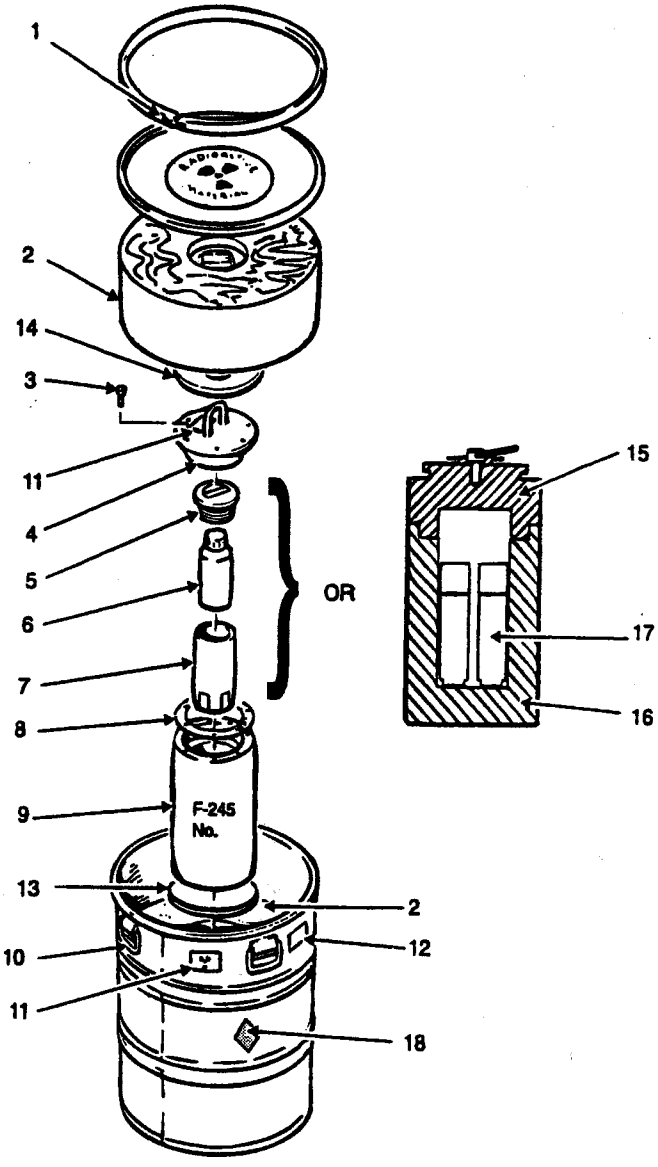
1. Revision 10: September 26, 1985. Addition of Australian Special Form capsules.
2. Revision 11: April 17, 1986. Certificate renewed.
3. Revision 12: May 8, 1989. Certificate renewed.
4. Revision 13: June 26, 1992. Certificate renewed.
5. Revision 14: April 28, 1995. Certificate renewed.
6. Revision 15: April 23, 1997. Addition of MDS Nordion Europe Special Form capsules. Certificate renewed.
7. Revision 16: June 25, 1999. Certificate renewed.

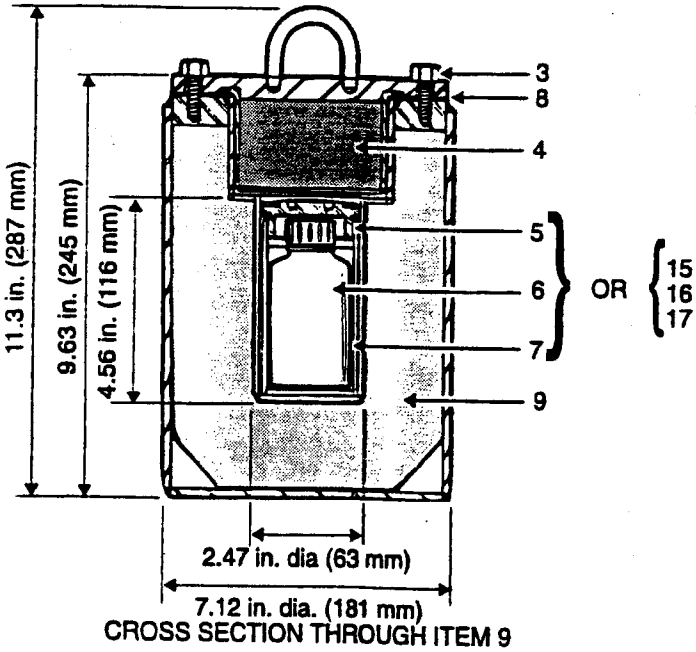
Parts List

1. Wire seal in locking bolt/ring
2. Wooden impact/fireshie[illegible]er
3. 3/8 – 16 x 7/8 in. long hex [illegible]l stainless steel screws (6)
4. Uranium shielded plug
5. F-248 leakproof insert cap with 'O'-ring seal
6. 4 oz (125 mL) receptacle containing radioactive material
7. F-248 leakproof insert body (see note 7)
8. Neoprene gasket
9. Uranium shielded container
10. Steel drum 19.25 in. dia x 20.5 in. high (489 mm x 521 mm)
11. Radiation caution plate (3): two on opposite sides of overpack, and one on top of shielded plug
12. Shipping container identification label (2): on two opposite sides
13. Lead plate 7¼ in (184 mm) dia x ¼ in (6 mm) thick (See Note 9)
14. Lead ring 7¼ in O.D. x 2⅜ I.D. x ¼ in thick (184 x 60 x 6 mm) (See Note 9)
15. F-336 tungsten insert cap
16. F-336 tungsten insert body
17. Sealed Ir-192 sources (See Note 8)
18. Radioactive category labels (2)

Notes

1. Approximate total weight: 277 lb (126 kg)
2. Projected floor load: 140 lb/ft^2 (691 kg/m^2)
3. Weight of uranium shielded pot: 197 lb (89 kg)
4. Depleted uranium shielding: 2.00 in (51 mm) thick, encapsulated in stainless steel
5. Meets IAEA Type B(U) requirements
6. AECB certificate CDN/2042/B(U)
7. F-248 leakproof insert used for shipment of Mo-99 or I-131
8. F-336 tungsten insert weighs 10 lb (4.5 kg) and is used to ship Ir-192 pellets in welded capsules.
9. Items 13 and 14 are fixed to the lower and upper wooden liners respectively.





CROSS SECTION THROUGH ITEM 9

NORDION INTERNATIONAL INC.

447 March Road, P.O. Box 13500
Kanata, Ontario, Canada, K2K 1X8
Tel: (613) 592-2790 • Fax. (613) 592-6937 • Telex. 053-4162

TITLE: **F-327/F-245 Transport Packaging**

REF. DWG.	REVISED	DCN
F124501001/ F124505001	SEP 95	A0504-D-02A

DATE: APRIL 69	DRAWN	CHECKED	APPROVED	No.	ISSUE
			MK per GAB	F-327/F-245	N

SHEET 1 OF 2

Certification

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

RADIOACTIVE MATERIAL TYPE B(U) PACKAGE DESIGN APPROVAL CERTIFICATE NO. CDN/2042/B(U), (REV. 16)

30-A2-206-0

April 27, 2001

AMENDMENT TO CERTIFICATION No. 1

(To be attached to the certificate)

This amendment to Package Design Approval Certificate No. CDN/2042/B(U), (Rev. 16) extends the expiry date to October 31, 2001.

All other aspects are as recorded in the certificate.

ISSUED BY

P. Eyre
Designated Officer pursuant to
subsection 37.(2)(a) of the
Nuclear Safety and Control Act

Canada

Certification

Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

RADIOACTIVE MATERIAL TYPE B(U) PACKAGE DESIGN APPROVAL CERTIFICATE NO. CDN/2042/B(U), (REV. 16)

30-A2-206-0

August 9, 2001

AMENDMENT TO CERTIFICATION No. 2

(To be attached to the certificate)

This amendment to Package Design Approval Certificate No. CDN/2042/B(U), (Rev. 16) extends the expiry date to January 31, 2002.

All other aspects are as recorded in the certificate.

ISSUED BY

A. Aly
Designated Officer pursuant to subsection 37.(2)(a) of the Nuclear Safety and Control Act

Canada